

FILE B

Science and Technology:

Item Information and Scoring Guide Reference

Sheet and Quantities of Items by Type B-2

Item Information and Scoring Guide Reference Sheet B-3

Quantities of Items by Type B-4

Items with Keys, Learning Results, Scoring Guides,

Training Notes, and Student Responses B-5

[Back to Table of Contents](#)

Science and Technology:

**Item Information and Scoring Guide Reference Sheet,
and Quantities of Items by Type**

Item Information and Scoring Guide Reference Sheet

The following pages are designed to assist you in understanding how Maine Educational Assessment (MEA) items are scored. These pages contain the text for each item accompanied by the following information.

- **MC#:** the multiple-choice item position
- **Key:** the letter of the correct answer for the multiple-choice item
- **Learning Results:** the content standard, followed by the performance indicator, that the item measured
- **SA#:** the short-answer item position
- **Learning Results:** the content standard, followed by the performance indicator, that the item measured
- **Short-Answer Scoring Guide:** the two-point description used to determine the score
- **Training Notes:** in-depth descriptions or particular information used to determine the score
- **CR#:** the constructed-response item position
- **Learning Results:** the content standard, followed by the performance indicator, that the item measured
- **Constructed-Response Scoring Guide:** the four-point description used to determine the score
- **Training Notes:** in-depth descriptions or particular information used to determine the score

MAINE 2001–2002

Science and Technology Grade 4

The table below shows the quantities of released items for each item type. Item information for all item types and scoring information (guides and training notes) for all short-answer and constructed-response items follow.

QUANTITIES OF ITEMS BY TYPE

MC	SA	CR
20	5	5

**Items with Keys, Learning Results, Scoring Guides,
Training Notes, and Student Responses**

1. Someone said, "Scientists discovered that there is enough water on the Moon to make it possible for humans to live there." Which of the following would be the best place to check to see if this statement is true?
 - A. a popular magazine
 - B. the morning newspaper
 - C. a high school laboratory
 - D. the government space agency

MC#: 1

Key: D

Learning Results: L-6

Communication

- L Students will communicate effectively in the application of science and technology. Students will be able to
- 6 cite examples of bias in information sources and question the validity of information from varied sources.

2. Some scientists think that world climate will get warmer over the next 500 years. Which of the following adaptations would help mammals to survive in this warmer climate?
- A. fur that is light colored and short
 - B. longer legs for fast running
 - C. larger and stronger bodies
 - D. sharper claws and longer teeth

MC#: 2

Key: A

Learning Results: D-3

Continuity and Change

- D Students will understand the basis for all life and that all living things change over time. Students will be able to
- 3 explain how adaptations, in response to change over time, may increase a species' chances of survival.

3. Which of these planets is closest to the Sun?
- A. Pluto
 - B. Saturn
 - C. Venus
 - D. Earth

MC#: 3

Key: C

Learning Results: G-1

The Universe

- G Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates. Students will be able to
- 1 illustrate the relative positions of the sun, moon, and planets.

4. Marcy hangs wet clothes on the line every morning and times how long it takes her clothes to dry. After six days, she had gathered the following data.

Day	Weather	Time to Dry (minutes)
1	sunny	45
2	sunny	40
3	cloudy	45
4	sunny	30
5	cloudy	60
6	cloudy	55

Which conclusion should she reach by using her data?

- A. On sunny days, clothes dry faster than on cloudy days.
- B. On cloudy days, clothes dry faster than on sunny days.
- C. Clothes dry in the same amount of time on sunny and cloudy days.
- D. You need wind to dry clothes.

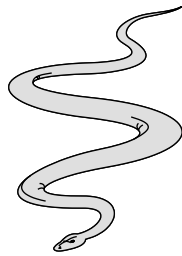
MC#: 4

Key: A

Learning Results: K-3

Scientific Reasoning

- K Students will learn to formulate and justify ideas and to make informed decisions. Students will be able to
- 3 draw conclusions about observations.



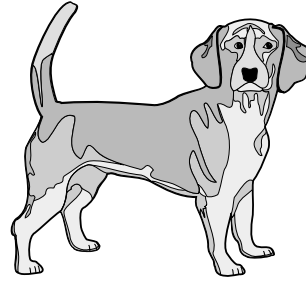
snake



fish



mouse



dog

5. Which are the best characteristics to use to put these animals into TWO groups?
- A. land and air
 - B. fur and scale
 - C. young and old
 - D. producer and consumer

MC#: 5

Key: B

Learning Results: A-2

Classifying Life Forms

- A Students will understand that there are similarities within the diversity of all living things. Students will be able to
- 2 design and describe a classification system for organisms.

6. What is the major role of decomposers in an ecosystem?
- A. produce food for the system
 - B. act as low-level predators
 - C. break down dead material
 - D. release oxygen for breathing

MC#: 6

Key: C

Learning Results: B-2

Ecology

- B Students will understand how living things depend on one another and on non-living aspects of the environment. Students will be able to
- 2 explain the difference between producers (e.g., green plants), consumers (e.g., those that eat green plants), and decomposers (e.g., bacteria that break down the “consumers” when they die), and identify examples of each.

7. Which of the following appeared on Earth MOST recently?
- A. dinosaurs
 - B. alligators
 - C. insects
 - D. humans

MC#: 7

Key: D

Learning Results: D-1

Continuity and Change

- D Students will understand the basis for all life and that all living things change over time. Students will be able to
- 1 identify present day organisms that have not always existed, and past life forms that have become extinct.

8. In Maine, people often build with bricks that have to be hard and strong to last in the wet, cold climate. In parts of the southwest United States and northern Mexico where it is usually hot and dry, people often build with soft adobe bricks. Why do they not use the same hard bricks used in Maine?
- A. It costs too much to ship hard bricks to the southwest United States.
 - B. It is much more difficult to build with hard bricks.
 - C. Hard bricks are too heavy.
 - D. Adobe bricks work fine where the climate is hot and dry.

MC#: 8

Key: D

Learning Results: M-1

Implications of Science and Technology

- M Students will understand the historical, social, economic, environmental, and ethical implications of science and technology. Students will be able to
- 1 explore how cultures have found different technological solutions to deal with similar needs or problems (e.g., construction, clothing, agricultural tools and methods).

9. Gordon was asked to make a table showing the number of days it rained in his town during the month of April. He designed the table below.

DAYS WHEN IT RAINED IN APRIL

DATE	RAIN	NO RAIN
April 1		
April 2		
April 3		
April 4		

Gordon will write the date in the first column each day. As Gordon observes the weather each day, he should complete the table by

- A. describing daily weather conditions.
- B. putting a circle around the date.
- C. putting a check to show rain or no rain.
- D. measuring the amount of rain that fell.

MC#: 9

Key: C

Learning Results: L-4

Communication

- L Students will communicate effectively in the application of science and technology. Students will be able to
- 4 make and/or use sketches, tables, graphs, physical representations, and manipulatives to explain procedures and ideas.

10. When you sharpen a pencil, the shavings are different from the solid wood in the pencil. Making the shavings is an example of
- A. a change in state.
 - B. a physical change.
 - C. a change in energy.
 - D. a chemical change.

MC#: 10

Key: B

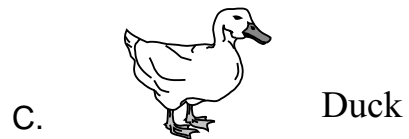
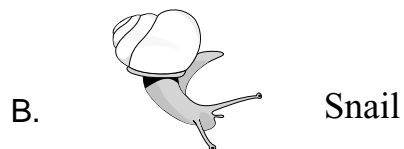
Learning Results: E-2

Structure of Matter

- E Students will understand the structure of matter and the changes it can undergo. Students will be able to
- 2 explain how matter changes in both chemical and physical ways.



11. Which animal could live in this habitat?



MC#: 11

Key: D

Learning Results: A-3

Classifying Life Forms

A Students will understand that there are similarities within the diversity of all living things. Students will be able to

3 describe the different living things within a given habitat.

12. Name TWO forms of energy that are given off by a television set when it is turned on.

SA#: 12

Learning Results: H-1

Energy

H Students will understand concepts of energy. Students will be able to

1 identify different forms of energy (e.g., light, sound, heat).

SHORT-ANSWER SCORING GUIDE

Score	Description
2	Student correctly names two forms of energy given off.
1	Student correctly names one form of energy.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Short-Answer #12

The operating television set primarily gives off sound and light energy. It also gives off some heat.

Student Responses for Short-Answer #12 for Score Points 2 and 1

12.

Light sound

2

12.

Heat and light

2

12.

1

sound
music

12.

1

static electricity
light

13. You and a friend were outside on a dark night when you saw flashing lights in the sky, low near the horizon. The lights seemed to move slowly. Your friend thought they might be a flying saucer. Name one thing that is more likely to have caused the flashing lights.

SA#: 13

Learning Results: K-1

Scientific Reasoning

K Students will learn to formulate and justify ideas and to make informed decisions. Students will be able to

1 give alternative explanations for observed phenomena.

SHORT-ANSWER SCORING GUIDE

Score	Description
2	The student names a logical source of the flashing lights.
1	The student names a source that is not logical or possible.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Short-Answer #13

Logical sources of the flashing lights are lights on a radio-television tower or smokestack, or an airplane, airport lights, police lights, or northern lights. It could even be a school bus driving on a distant hill. It is not logical or possible that it could be a planet, comet or meteor, or anything extraterrestrial.

13.

2

Something else
could be a helicopter
or a plane.

13.

2

It could have been
the Aroua-Borialis.

13.

1

Two fireflies,
Two flash lights
and a cars head-
lights.

13.

1

Some people having
a fire,



14. This is a single-celled organism. Like all living organisms, it must be able to get, or do, all of the things that are necessary for life. Describe THREE things this organism needs to do to stay alive.

CR#: 14

Learning Results: C-2

Cells

C Students will understand that cells are the basic units of life. Students will be able to
2 describe how single-celled organisms exist.

CONSTRUCTED-RESPONSE SCORING GUIDE

Score	Description
4	Student demonstrates a comprehensive understanding of meeting the needs of life. There are no errors.
3	Student has a broad but general understanding of the necessities of life. There are minor errors or misconceptions.
2	Student's understanding of meeting the necessities of life is limited in scope. There are errors or misconceptions.
1	Student has a minimal understanding of the necessities of life. There are major errors or misconceptions.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Constructed-Response #14

Score	Description
4	Describes three needs of living things. There are no errors.
3	Correctly describes two needs. OR Describes three needs with minor errors.
2	Correctly describes one need. OR Describes two or three needs with major errors.
1	Describes one or two needs with major errors or misconceptions.

The needs of all living things include ability to get food, ability to get water, and ability to eliminate waste. In addition, almost all organisms, including the paramecium, must be able to get oxygen, and most animals must be able to move. All organisms must exist in, and respond to, a suitable habitat with appropriate temperature, appropriate medium (water in the case of the paramecium), etc. The list can be extended by adding specific details (e.g., water with dissolved oxygen, etc.). Reproduction is not necessary for the individual to stay alive but is necessary to the survival of the species. Consider “reproduction” to be a minor error.

14.

4

The organism has to get oxygen, and H_2O (water). It really needs oxygen to survive because every living organism needs oxygen to stay alive. It needs food too, like smaller organisms. That's what I think the paramecium needs, water, air and food.

14.

4

The organism needs these three things, it needs some sort of food source to live, it also needs water to not dehydrate, and it needs to be able to move or it can't get food or water.

14.

3

It will need food, water, and air to stay alive just like we need food, water, and air to live. Another thing it might need is to move around.

14.

3

You need oxygen, water, and food.

14. Three thing a single-celled organism 2
needs to live is, food, water
and room to grow. Those are
my gusses to how a single-celled
organism lives.

14. d, might need air, and it 2
might need food, and it
might need to move around
so it can get the air and
get the food,

14.

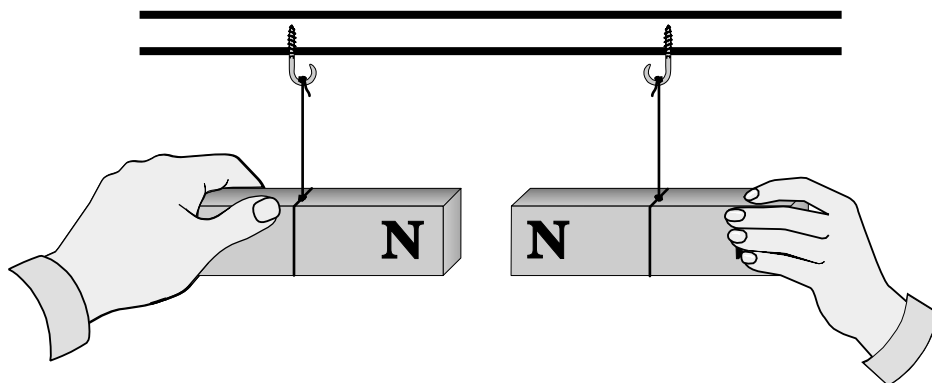
1

Blood, Food, Air.

14.

1

I needs calcium from dairy products like Milk. they need water so it wont die because it needs to stay wet. It needs it need fruit to grow and to get energy.



15. Two strong magnets, as shown in the picture, are free to swing on their strings if they are released. Describe an experiment you could do with these magnets to prove that like magnetic poles repel, or push apart, AND unlike magnetic poles attract, or are pulled together.

CR#: 15

Learning Results: J-2

Inquiry and Problem Solving

- J Students will apply inquiry and problem-solving approaches in science and technology. Students will be able to
- 2 conduct scientific investigations: make observations, collect and analyze data, and do experiments.

CONSTRUCTED-RESPONSE SCORING GUIDE

Score	Description
4	Student makes insightful and important connections in describing a test that could provide proof of proposition.
3	Student describes a test that makes several important connections that would support the proposition. There are minor errors or misconceptions.
2	Student makes only the obvious connections in describing a test that would not be conclusive. There are major errors.
1	Student is not able to connect facts with proof. Understanding is minimal.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Constructed-Response #15

Score	Description
4	Observations and interpretation from the tests described will provide conclusive evidence to support the proposition. Tests described are clear. There are no misconceptions.
3	Observations and interpretation from the tests described will support the proposition without being conclusive. There are minor misconceptions.
2	Obvious interactions are described without interpretation. There are misconceptions and omissions.
1	Activity described is related to the problem but does not constitute a test. Understanding is minimal.

In the simplest test, the magnets as shown could be released and observed to see them move apart, spin, and finally come together with opposite poles held together by an attractive force. If the alternate arrangement is set up with a south (S) pole opposite a north (N) pole, when released, the two ends of the magnets will be pulled together. Observation and interpretation of the results of these two setups of the equipment provide proof of the proposition. Describing multiple trials adds strength to the response.

15.

4

Take two strong magnets with their poles painted on them and tie a string to each one. Then tie the string to a screw or tac hanging from a board that has been placed across two boxes. Then take one magnet in each hand and push either the two north poles or the two south poles together. They will push away from each other. After, take a north and a south and push them together. They will come together. This is all because opposites attract and similars repel.

15.

4

You could do a experiment to prove two north ends repel by placing them together. They would repel because they have the same magnetic pull so it would push off each other. The same would happen with two south sides, too. But if a north and south side are pushed together, their magnetic forces would attach and hold together. This would happen because they have different magnetic fields that would attach with the others and wouldn't happen with two norths because their magnetic fields are the same.

If a N and a N go together they repel so if a N and N don't work try a S and S but they don't go together so let's try S and a N wow!! They attract so South and North go together Because there's different magnets.

Plus S and N go together not N and N or S and S it's S and N!!!

15. Set them, on the table by the S N ³
on the magnet with a space between
them and watch what will happen. The
two magnets will stick to each other.
Set them on S S or N N and have a
space between them. Set go of the
magnets and watch what will happen.
Instead of sticking to each other,
they will go away from each other.

15.

2

You put the two negative sides together and prove that they will not attract. To make them attract you need a negative and a positive.

15.

2

If you put the North near the South it is going to connect but if you put the North near another North it will push apart.

15.

1

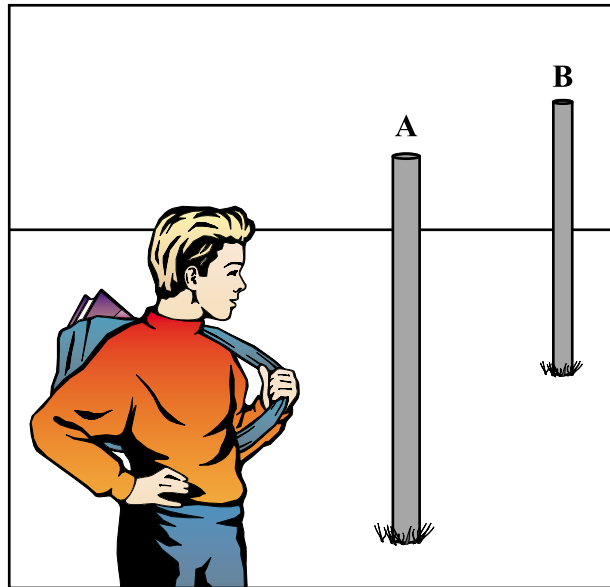
You could push the two magnets together making the two N's, touching to see if the two magnets repel, or push apart.

15.

1

I could see if the magnets stick together or not

You would have to put south by the North to have it stick together



16. Jerry was looking at two posts in the ground. One was close to him. The other was farther away. Jerry said he thought the closer post, post A, was taller than post B. Which would be the BEST way to find out if he was right?
- A. Go stand by post B and see if post A still looks tallest.
 - B. Measure the height of both posts and compare the results.
 - C. Stand between the two posts and see which looks tallest.
 - D. Measure post A to see if it is as tall as he thought it was.

MC#: 16

Key: B

Learning Results: K-4

Scientific Reasoning

K Students will learn to formulate and justify ideas and to make informed decisions. Students will be able to

4 use various types of evidence (e.g., logical, quantitative) to support a claim.

17. Beverly said that cats hunt at night because they like to prowl. Which of the following BEST explains why cats hunt at night?
- A. Cats see better at night than the animals they hunt do.
 - B. Hunting is cooler at night than it is during the day.
 - C. Cats hunt animals that are only out at night.
 - D. Cats always sleep in the daytime.

MC#: 17

Key: A

Learning Results: K-5

Scientific Reasoning

- K Students will learn to formulate and justify ideas and to make informed decisions. Students will be able to
- 5 demonstrate an understanding that ideas are more believable when supported by good reasons.

18. Julius watched very closely as his teacher took two clear liquids and poured them together into one test tube. Suddenly, the mixture of liquids turned blue. Which explains the new color?
- A. The liquid became very cold.
 - B. The test tube had some dirt in it.
 - C. There was a chemical change.
 - D. Several minutes passed.

MC#: 18

Key: C

Learning Results: E-1

Structure Of Matter

- E Students will understand the structure of matter and the changes it can undergo. Students will be able to
- 1 describe how the physical properties of objects sometimes change when one object chemically combines with another.



19. As soon as Deena kicks the soccer ball across the grass, friction begins to act on the ball. In time, friction will cause the ball to
- A. bounce off the ground.
 - B. keep moving in the same direction.
 - C. change the direction in which it is moving.
 - D. slow down and finally stop.

MC#: 19

Key: D

Learning Results: I-1

Motion

- I Students will understand the motion of objects and how forces can change that motion. Students will be able to
 - 1 describe the effects of different types of forces (e.g., mechanical, electrical, magnetic) on motion.

20. Homes were built in an area where rattlesnakes were common. Some home owners complained that the snakes should be killed. Others were against killing them. Who would give the best advice on what to do?

- A. a man who is afraid of snakes
- B. a scientist who studies snakes
- C. a woman who was bitten by a snake
- D. someone who loves all animals

MC#: 20

Key: B

Learning Results: L-6

Communication

- L Students will communicate effectively in the application of science and technology. Students will be able to
- 6 cite examples of bias in information sources and question the validity of information from varied sources.

21. The Moon stays in orbit around Earth because of
- A. magnetism.
 - B. solar energy.
 - C. gravity.
 - D. electric force.

MC#: 21

Key: C

Learning Results: G-4

The Universe

- G Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates. Students will be able to
- 4 explore the relationship between the earth and its moon.

22. Which of the following could be INHERITED, rather than learned, from parents?

- A. good table manners
- B. blue eyes
- C. interest in sports
- D. liking chocolate

MC#: 22

Key: B

Learning Results: D-4

Continuity and Change

- D Students will understand the basis for all life and that all living things change over time. Students will be able to
- 4 describe ways in which organisms may be similar to and different from their parents and explore the possible reasons for this.

23. A MAJOR function of the human respiratory system is
- A. breaking down food.
 - B. breathing air.
 - C. moving blood.
 - D. getting rid of solids.

MC#: 23

Key: B

Learning Results: C-4

Cells

C Students will understand that cells are the basic units of life. Students will be able to
4 describe the functions of the major human organ systems.

24. Suppose you dropped a quarter on the sidewalk and it rolled down a drain. You could see it easily, but you could not reach it with your fingers. Which of the following would be the best choice of materials to use to invent a way to get your quarter back?
- A. a long thin stick and a piece of gum
 - B. a sheet of paper and a safety pin
 - C. a piece of string and a long nail
 - D. a piece of wire and a fishhook

MC#: 24

Key: A

Learning Results: J-4

Inquiry and Problem Solving

- J Students will apply inquiry and problem-solving approaches in science and technology. Students will be able to
- 4 design and build an invention.

25. Your class is going to do an investigation to find out if the boys in the class are taller than the girls. Name two important group roles that will have to be assigned to students to carry out the investigation.

SA#: 25

Learning Results: L-7

Communication

- L Students will communicate effectively in the application of science and technology. Students will be able to
- 7 function effectively in groups within various assigned roles (e.g., reader, recorder).

SHORT-ANSWER SCORING GUIDE

Score	Description
2	Student correctly names two important roles.
1	Student names two roles related to the investigation. At least one may not be important.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Short-Answer #25

Important roles include: investigation leader, planner, measurer, recorder, interpreter. Students may use different titles for these roles. Related, but not important, roles include: equipment person, clean-up person, discipline keeper, researcher.

The essential tasks are recording and organizing (charts, tables, etc.) the data as others do the planning, manipulation, measuring, etc. The recorder will also describe the procedure that is followed. This duty could be extended to doing graphs, displays, etc.

25.

Two important roles would
be measuring and
comparing.

2

25.

To find out if the
boys are taller than the
girls they have to make
a chart and measure each other.

2

25.

One group has to measure
the boys and girls and the
2nd has to find out if the
boys are taller than the
girls

1

25.

1. someone who measures
people
2. the kids!!!

1

26. Make a picture that shows the positions of the Sun, the Moon, and Earth when there is a full moon. Be sure to include labels on your picture.

SA#: 26

Learning Results: G-1

The Universe

- G Students will gain knowledge about the universe and how humans have learned about it, and about the principles upon which it operates. Students will be able to
- 1 illustrate the relative positions of the sun, moon, and planets.

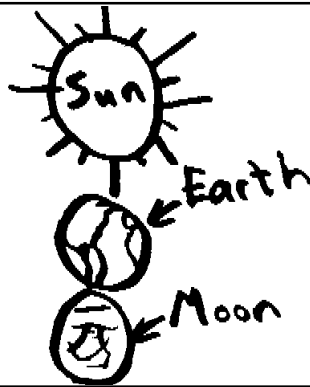
SHORT-ANSWER SCORING GUIDE

Score	Description
2	Student correctly makes and labels a picture of the relative positions.
1	Student makes and labels a picture in a way that is vague or has errors.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Short-Answer #26

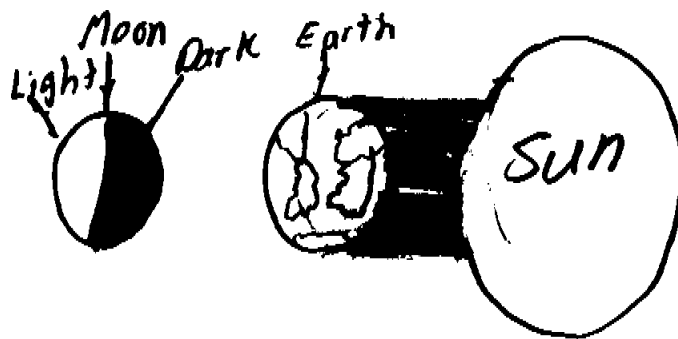
The three bodies must be lined up with Earth in the middle. This can be stated in several ways (e.g., "Earth must be between the Sun and the Moon") or with a labeled diagram. A vague response is "They are all lined up," or "The Moon is farther from the Sun than Earth is," or an unlabeled diagram.

26.



2

26.



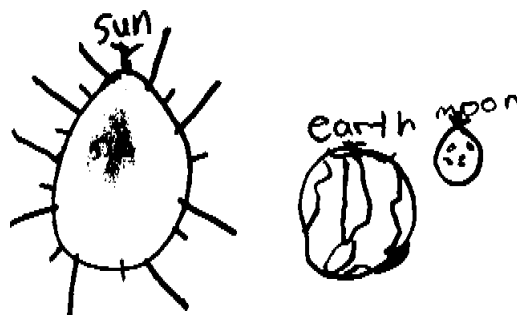
2

26.



1

26.



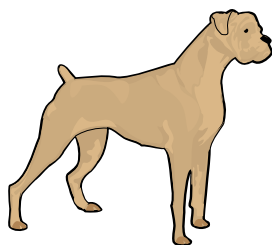
1



Beagle



Collie



Boxer



Terrier



St. Bernard

27. Describe one physical characteristic of the dogs shown above that could be used to classify them into two groups.

SA#: 27

Learning Results: A-1

Classifying Life Forms

A Students will understand that there are similarities within the diversity of all living things. Students will be able to

1 group the same organisms in different ways using different characteristics.

SHORT-ANSWER SCORING GUIDE

Score	Description
2	The student clearly and correctly describes one characteristic.
1	The student attempts to describe a characteristic but is vague. There is minimal understanding.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Short-Answer #27

From the pictures, the dogs could be grouped by size, length of hair, length of ears or snout, etc. Some students will know specific physical characteristics of the breeds, which could be used even though the pictures only identify the breed name.

27.

you could sort
the dogs by the
length of hair
short or long.

2

27.

You can put big and
small in a group.
Like the Boxer, St. Bernard
and the collie and then
the terrier and the Beagle.

2

27.

1

There all different
sizes.

27.

1

Who has the
most fur.

28. Explain how the frozen water in the snow this winter can be the same water that falls as rain next summer at a place far away.

CR#: 28

Learning Results: F-4

The Earth

- F Students will gain knowledge about the earth and the processes that change it. Students will be able to
- 4 illustrate how water and other substances go through a cyclic process of change in the environment.

CONSTRUCTED-RESPONSE SCORING GUIDE

Score	Description
4	Student gives a very coherent explanation of the process that occurred. There are no errors.
3	Student gives a generally coherent explanation of the process that occurred. There are minor errors and/or omissions.
2	Student's response lacks coherence. There are major errors and/or omissions.
1	Student makes few connections. There is minimal understanding.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Constructed-Response #28

Score	Description
4	Clearly explains the order and processes in the water cycle. There are no errors.
3	A correct cycle is described, but explanation is not totally clear or complete. There are minor errors and/or omissions.
2	A partial cycle is described. There are major errors and/or omissions.
1	Explanation is limited but related to the water cycle.

The snow melts to form puddles or runs off as surface water into streams and lakes, or percolates into the ground. Eventually, it evaporates to become water vapor in the air where it moves to distant places with moving air currents, condenses in clouds to form water droplets and, because of change in season, falls as rain rather than as snow as it did at an earlier time.

28.

4

Because The ice and snow melt goes into the streams, but some water goes into the "water system" (when the water goes into the ground evaporates goes into the clouds the clouds move until they collect enough evaporated water and then it rains) such as all the ice and snow melts off the Rocky mountains some water goes into the water system and all the rest of the water goes into streams and ponds. The clouds pick up evaporated water and keep moving until the clouds cannot carry any more evaporated water and then another state (like Maine) will get alot of rain.

The frozen water in the snow that fell this winter can be in the rain that falls during the middle of the summer because of the water cycle because first the snow melts then the water from the melted snow gets evaporated, making a small cloud after when the cloud moves it collects more water and becomes a bigger cloud then after moving miles and miles away from the snow that was first evaporated it rains in a place very far away.

28. It can happen because of the water ³ cycle. It all goes around time after time. The water from lakes, and rivers, floods, and streams, from the ocean, and from the hot water springs, evaporates in the air.

Then it goes even higher and turns colder and it is condensation and then it goes down again and turns into precipitation. Then it is on the ground again. Before the snow evaporates it has to melt.

I think the water cycle is fascinating.

28. The snow can be the same as the water because if the weather is warm the snow will evaporate that means it will float up in the sky but you can't see it and end up in the clouds that is called condensation and all the little bits of water that evaporated is up in the sky and that water will get too heavy up in the clouds and the rain all comes down to the ground. That is called precipitation and that is the same snow that was here the last winter and it all happens over and over again and it keeps happening evaporation, condensation, then precipitation.

3

28.

2

The rain that falls next summer at a place far away is because when the snow evaporates it melts into water, then it gets lifted up in the air, formed into a cloud, and then the clouds could possibly move all the way to a far away place, and by that time it would be summer. Then the rain would fall.

28.

2

The water evaporates into clouds and the clouds move around the earth and then it rains somewhere else.

28.

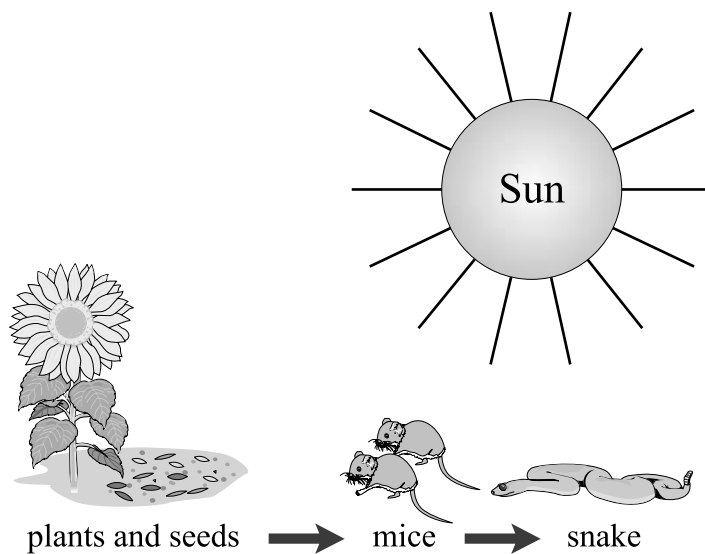
1

The water falls to the ground and then evaporates and goes up and then it rains again and it elevates itself up again. That is the water cycle.

28.

1

All of the rain that falls turns in to snow when it is falling. The snow evaporates into the sky. It turns into a cloud with dust. Then it rains down again whenever it's ready. Then it goes through that process again and again until it is too warm for it to snow.



29. In a small area there are some plants (that produce seeds), some mice, and a snake.
- Explain what the Sun does to help produce food for the mice.
 - Explain what the Sun does to help produce food for the snake.

CR#: 29

Learning Results: B-4

Ecology

- B Students will understand how living things depend on one another and on non-living aspects of the environment. Students will be able to
- 4 investigate the connection between major living and non-living components of a local ecosystem.

CONSTRUCTED-RESPONSE SCORING GUIDE

Score	Description
4	The student states fully developed explanations for both parts of the question.
3	The student states explanations, developed in general terms, for both parts of the question.
2	The student states a partially developed explanation for one, or both, parts of the question.
1	The student states a minimally developed explanation for one, or both, parts of the question.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Constructed-Response #29

Score	Description
4	Student clearly and correctly interprets the food chain by explaining the Sun's role in (a) producing food for the mice and (b) producing food for the snake. There are no errors or misconceptions.
3	Student explains the basic effects of sunlight on (a) and (b) through the sequence of the food chain. There are minor errors and/or omissions.
2	Student recognizes that there is a food chain but does not specify relationships. There are major errors and/or omissions.
1	Student's response is related to the problem but does not connect the Sun with providing food for the mice or snake. Only minimal understanding is demonstrated.

This is a very simple food chain. Plant producers are consumed by mice, which are consumed by the snake. Sunlight makes it possible for plants to grow, and plants make it possible for mice to live. In turn, the mice are prey for the snake, making it possible for the snake to live. Without sunlight, the initial energy for the system, none of the organisms would exist in the area.

29a.

4

The sun helps the plant grow
and seeds fall off the plant then
the mice eat the seeds that fell
off the plant that the sun help grow.

b.

The sun makes the plan grow
then the mice eat the plant
then the snake eats the mice
that ate the plant that the
sun helped grow.

29a.

The Sun helps produce food for the mice because the sun helps the plants grow which produces seeds for the mice.

4

b.

The Sun helps produce food for the snake because the Sun helps the plants grow which produces seeds for the mice that produces food for the snake.

29a.

3

The suns light helps the plant by strengthening it and making it grow. Then mice eat the seeds that fall from it.

b.

The sun makes the plant grow. Then the plant drops its seeds. The mice eat the seeds and become large and slow. Then the snake gets the mice easier.

29a.

The sun makes the food for the mice by giving the plant light and heat, so the plant will survive, and be able to live.

The sun needs to be there so the plant will survive, so the mice have something to eat.

b.

The sun makes food for the snake because the sun gives heat and light to the plant so it will give seeds to the mice, so then the snake can eat the mice.

3

29a.

It helps form seeds, so the mice can eat the seeds and live. That's what the sun does for the mice

2

b.

When the mice get fat the snake has some prey to eat. The mice eat seeds that gets them fat then comes the snake and eats them. That's what I mean.

29a.

2

The sun gives food to the plant.
So the plant can make seeds for
the mice.

b.

The sun gives the plant food. The
plant gives seeds to the mice and
the snake eats the mice.

29a. The sun helps the plants to grow, 1
because of its warmth (we wouldn't be able
to grow things if it was so below) and
the mice eat the plants, and the seeds
drop also for the mice to eat.

b.

The sun helps the mice survive
because of its warmth and if we
didn't have warmth nothing could live
on earth. (not even bringing up mice)

29a.

1

Makes plant seeds fall off
the flower so that the
mouse can eat it.

b.

Once the mice are distracted
the snake eats them.

41. The Antarctic is a place where cold weather and storms make it very difficult for people to live, even for a little while. Describe TWO ways that modern inventions have made it possible to have human settlements there.

CR#: 41

Learning Results: M-3

Implications of Science and Technology

- M Students will understand the historical, social, economic, environmental, and ethical implications of science and technology. Students will be able to
- 3 explore how technology (e.g., transportation, irrigation) has altered human settlement.

CONSTRUCTED-RESPONSE SCORING GUIDE

Score	Description
4	Student makes complex as well as simple connections between conditions and available technological developments.
3	Student makes mainly simple connections between conditions and technical developments. There are minor errors and/or misconceptions.
2	Student makes only a most basic connection. There are major errors.
1	Student attempts to relate to the problem but fails to make a meaningful connection.
0	Response is incorrect or contains some correct work that is irrelevant to the skill or concept being measured.
Blank	No response.

Training Notes for Constructed-Response #41

Score	Description
4	Two valid and correctly described ways technological developments are applied in the Antarctic.
3	Two mostly valid ways technological developments are applied, described with minor errors and/or misconceptions.
2	One valid way development is applied, described with minor errors. OR Two descriptions of applications that are mostly wrong or are based on misunderstanding.
1	One description that is mostly wrong or based on misunderstanding.

Inventions that make maintenance of Antarctic settlements possible include: efficient heating systems; solar power and efficient electrical power production; energy-efficient buildings (insulation, air exchange, etc.); food preservation and dehydration; ground, water, and air transportation; warm but lightweight materials for clothing and wind protection; fuels and lubricants that are efficient at low temperatures; medicines; etc.

41. One of the modern inventions that help 4 make it possible to have human settlements at the Antarctic are generators. A generator gives off electricity. Electricity is what lets us use computers, ovens, T.V.s, refrigerators, heaters and other stuff like that. When the electricity goes out because of a storm a generator brings electricity back into a home. The other modern invention that helps make it possible to have human settlements is a radar system. A radar system helps track down storms. So if a huge storm was coming towards them they could track the storm down so miles away and evacuate before it was in sight.

41.

4

Two ways modern inventions made it possible for humans to live there is the invention of the snowmobile so people can get around on snow quick so they're not in the cold so long and the invention of electric radios, celphones, & walkie talkies to communicate with doctors or family if needed.

Modern inventions have made living in the Antarctic easy because new inventions like a Dome have been made. A dome is a house that make it easy for up to mabe 100 people can live in! Or radar so they can track you down in the snow to save you. Or solar power to make electricity.

41. One way is because of gas heaters it's warmer inside the shelter. Another is thermal clothing, it keeps your body warm in the cold weather. 3

41. People made igloos to keep warm from the weather. They used bear furs sewed together to keep warm so they can keep warm when outside the igloo to hunt. 2

41.

2

They have made genitots²
So people can have light and
heat and the other way
it to just make it possible
So we can actually live their.
but people would not be living
their if there was no possible
way to even live.

41.

1

1. I think that furnaces
and propane would be
essentialities in the arctic.
2. furs would also be
essential because they are
so warm.

41.

1

It is possipoc to live in cold places because
we've invented heaters and blankets,